AMENDMENTS TO THE SPECIFICATION

Please amend the specification as indicated hereafter. It is believed that the following amendments and additions add no new matter to the present application.

In the Drawings:

Submitted herewith are formal drawings. It is believed that the objections to the original drawings have been overcome.

In the Specification:

Please amend the paragraph No. 0002 as follows:

In optical fiber communications, connectors for ~~jointing~~ joining fiber segments at their ends, or for connecting optical fiber cables to active or passive devices, are an essential component of virtually any optical fiber system. The connector or connectors, in joining fiber ends, for example, has, as its primary function, the maintenance of the ends in a butting relationship such that the core of one of the fibers is axially aligned with the core of the other fiber so as to maximize light transmissions from one fiber to the other. Another goal is to minimize back reflections. Alignment of these small diameter fibers is extremely difficult to achieve, which is understandable when it is recognized that the mode field diameter MFR of, for example, a singlemode fiber is approximately nine (9) microns (0.009mm). The MFR is slightly larger than the core diameter. Good alignment (low insertion loss) of the fiber ends is a function of the transverse ~~office~~ offset, angular alignment, the width of the gap (if any) between the fiber ends, and the surface condition of the fiber ends, all of which, in turn, are inherent in the particular connector design. The connector must also provide stability and junction protection and thus it must minimize thermal and mechanical movement effects.

Please amend paragraph 0004, starting on page 1 as follows:

It can be appreciated that the process of attaching a connector to the end of a fiber, a process that often is performed in the field, requires human intervention, with consequent expenditure of time, and of uncertain accuracy. On the other hand, in the manufacture of jumper cables, *i.e.*, relatively short cable lengths with connectors at each end, for use in making interconnections on a patch panel, for example, the production thereof is substantially completely a manufacturing process, which lends itself to automation, thereby eliminating or reducing human intervention. Virtually the entire process of producing a connectorized end on a jumper cable can be, and, in the present state of the art, is performed by machine or robotic components. However, one phase of the operation has proved difficult to achieve by automation, and that is the cleaving of the fiber contained in the ferrule so as to be flat and flush with the end face of the ferrule. U.S. patent Nos. 4,710,605 of Presby, 4,932,989 of Presby, 5,256,851 of Presby, 5,421,928 of Knecht, and 6,413,450 of Mays, Jr., each shows an apparatus for cutting or forming fiber ends by means of a focused laser beam. In all such arrangements, the beam is formed to taper to a focal point, thereby producing a Gaussian shape power distribution with its maximum power being along the center of the beam axis, whereas the power gradually decreases away from the center. As a consequence, the cleaved fiber has a slightly angled end face, which is not perfectly flat and flush with the ferrule end face. It then becomes necessary to abrade and polish the fiber end face to make it flat and flush, with a consequent undesirable expenditure of time and possibly stressing of the fiber. Some prior art processes include apparatus for holding the fiber at an angle corresponding to the angle of the beam taper, thereby producing a flat face orthogonal with the fiber (and ferrule) axis. This solution, however, introduces additional apparatus, which is undesirable and requires precise angular orientation of the fiber. Further, in the ~~titled~~ tilted fiber and ferrule configuration, the laser beam is also focused on the ferrule surface, which may cause a undesirable damage on the ferrule.

Please amend paragraph 005 starting on page 2 as follows:

In prior art manual and/or automated systems for producing jumper cables, there is a large number of steps involved, from the cutting to length and coiling of the optical fiber cable to the final assembly of the connector. The steps involved, which will be discussed more fully hereinafter, include cutting and removing a portion of the outer jacket and Kevlar strength member (if any), stripping the buffer and coating to bare the fiber, and cleaving the fiber. The fiber is installed and cemented in the ferrule, and the end thereof cleaved to be flat and flush with the ferrule end. Because, as pointed out hereinbefore, the prior art cleaving methods do not produce a desired fiber end, several grinding and polishing steps are necessary, each step having a polishing apparatus and each consuming time and requiring, in total, a considerable amount of polishing consumables, (diamond ~~polish~~ polishing papers, for example). Each of the numerous polishing steps introduces some variability in the process, hence the large number of steps to achieve the desired flatness and flush end of the cleaved fiber. In the production of connectors, the number of connectors produced per unit of time, dubbed the beat rate, is a function of the number of polishing steps, the greater the number, the greater the beat rate. Thus, the necessity of several polishing stages, each with its consumables. When the number of polishing steps is large, it can be appreciated that the process is lengthened and the number of polishing apparatuses increased. Subsequent to the polishing steps and after testing of the ferrule and fiber end face, the connector is finally assembled on the end of the cable. It can be appreciated that a reduction of the number of process steps in the manufacture of connectorized jumper cables, and other types of connectorized cables to achieve an acceptable beat rate, is highly desirable.

Please amend paragraph 0006 starting on page 4 as follows:

The present invention is an automated assembly system wherein the number of processing steps, principally the grinding and polishing steps, is greatly reduced by a novel fiber cleaving apparatus that produces in one step, a substantially flat fiber end face. As in prior art cleaving apparatuses, a focused laser beam, which may be produced, for example, by a CW or pulsed CO_2 laser and which is employed to cleave the fiber, the beam ~~having~~ has a wavelength of, for example, 10.6 microns, and a Gaussian distribution as it emerges from the laser. The

apparatus includes a beam distorting member, such as a focusing lens, through which the beam is passed, which, by reason of its position with respect to the beam centerline, distorts the beam so that the Gaussian distribution is modified, and the focused beam has a substantially chisel shape, *i.e.*, one side of the beam is substantially flat and normal to the centerline of the fiber to be cleaved. This chisel shape produces, by means of substantially flat portion of the beam, a substantially flat fiber end face, and also one that is substantially flush with ferrule end face, in one pass of the beam across the fiber. As a consequence, the grinding step and substantially all of the intermediate polishing steps are eliminated, with only a final polishing and cleaning step being necessary for the desired beat rate.

Please amend paragraph 0020 starting on page 6 as follows:

Fig. 3 is a block diagram flow chart for a prior art manual or automated jumper cable production process. To facilitate the understanding of the process, it has been divided into a plurality of stages ~~31, 32, and 34 through 37~~ 31-37 representing automatic operations, although there may be some manual steps involved. While Fig. 3 represents an automated system, all of the steps performed may be, and have been, in the past, manual. Stage 31 includes the automated step of cutting the cable to the desired length, loading the connector parts thereon, which is usually done manually, removing the outer jacket and strength member, usually Kevlar®, stripping the buffer layer, cleaning the fiber and cementing it within the ferrule. The fiber projecting from the end or face of the ferrule is then cleaved in stage 32. The cleaving operation can use the conventional score-and-break technique or the laser cleave depicted in Fig. 2. Both methods leave the cleaved fiber projecting from the face of the ferrule, and the fiber end face is thus neither flat nor flush with the ferrule end face. It is necessary, therefore, in stage 33 to grind the fiber end~~, as in stage 34~~ by suitable grinding apparatus [[41]], and then polish it in a plurality of polishing stages [[42a]] 34a through [[42j]] 34i until the desired flatness and flush condition are achieved. Each polishing apparatus [[42]] 34a-34i polishes for approximately thirty seconds, and, as shown in Fig. 3, there are nine such apparatuses. Thus a single work piece passing through the stage 34 polishing does so in approximately four and one-half minutes. However, in a production line milieu, each polishing apparatus [[42]] 34a-34i will be operating on a separate work piece at the same time and, therefore, the second work piece exits stage 34

only thirty seconds behind the first work piece. Thus, the beat rate for the stage 34 and, in actuality, for the entire apparatus of Fig. 3, is approximately two connectors per minute. This rate can be increased by increasing the number of polishing apparatuses, thereby decreasing the amount of time spent per polishing apparatus [[42]], such as, for example, twenty seconds. After the cable passes through stage 34, it is subjected to an optical tuning in stage 35, a final inspection and test in stage 36 and a final assembly in stage 37.

Please amend paragraph 0022 starting on page 7 as follows:

In Fig. 4 there is shown, in accordance with the present invention, an improved process from the laser cleave to and including final packaging. In Fig. 4, stage 41 includes connector pre-assembly, the connector pre-assembly, the output of which is directed to the laser cleaving apparatus 42 of the present invention, as will be discussed more fully hereinafter. The output of the cleaving apparatus is directed to a single step polishing stage 43, which roughly corresponds to module 34 of Fig. 3, and which requires less than thirty seconds to produce a clean, flat fiber end that is flush with the ferrule end face.

Please amend paragraph 0026 starting on page 8 as follows:

Fig. 5 depicts the focusing of the laser beam 26 in the prior art apparatus depicted in Fig. 2 by means of lens 28. To achieve focusing at a point, the centerlines of the beam 26 and of the lens 28 are coincident. The beam 26, prior to passing through lens 28 has a Gaussian intensity distribution as shown in curve A, and after passing through lens 28, becomes focused [[by]] but still ~~having~~ has the Gaussian shape distribution as shown in curve B. The focused beam 26' converges to a point on fiber 17, thereby cleaving it. Because of the Gaussian distribution as shown in curve B, the laser power has the maximal power in the center and gradually reduce the power to the edge. It causes the beam center ~~tempearture~~ temperature to be higher than the edge, thus ~~cuts~~ cutting deeper. This effect plus the wedge shape of focused beam 26' result in an angular end face of fiber 17, as discussed hereinbefore and as shown in Fig. 5a. It can further be seen that the tapered beam 26' will be partially interfered with by the end of ferrule 16 if the cleaving point is too near the ferrule end face. This necessitates having the cleaving point at a

distance X from the ferrule end face to prevent such interference. It is common practice to ~~heave~~ have a curved ferrule end face, not shown, in which the distance X can be reduced to some extent. There remains, however, an undesirable length of projection of the fiber 17 from the ferrule end face after cleaving. It is the projection, and the angular end face of the fiber, that must be eliminated by the numerous grinding and polishing steps shown in Fig. 3.

Please amend paragraph 0028 beginning on page 9 as follows:

Fig. 7 depicts an apparatus 51 for performing the cleaving operation of stage 42 of Fig. 4 Apparatus 51 comprises, preferably, a CO_2 laser 52, which emits a beam 26 having a wavelength of preferably 9.3 microns. It is to be understood that other laser types and other wavelengths may be used, however, the CO_2 laser of 9.3 microns wavelength has been found to work extremely well in cleaving the fiber 17. The beam passes through the distorting member 53, shown in Fig. 7 as a lens 54 mounted in a suitable holder 56. A positioning member 57 is adapted to move the member 53 into the proper position, as described in ~~correction~~ connection with [[Fib.]] Fig. 6. The distorted beam 26" is focused on the fiber 17 mounted in ferrule 16 as described in connection with Fig. 6. Ferrule 16, and other parts of the connector, not shown is mounted on a holder 58 which is, in turn, mounted on a movable support member 59 which is movable both vertically and horizontally, as shown by the arrow, to position the fiber to be cleaved at the focal point of beam 26". A microscopic camera 61 is focused on the ferrule end face, fiber, and beam focal point and is adapted to send signals indicative of the positions thereof to a control panel 62, which in turn is connected to a CPU 63 and display 64. The CPU 63 and control pane 62 on the basis of the signals received from the camera 61 send signals to member 57 and 59 to position the ferrule and fiber relative to distorted beam 26" as shown in Fig. 6, and display device 64 given visual monitoring of the positioning operation. Cleaving then takes place, after which the signal stage 43 polishing takes place